IN THE CLAIMS

1. (currently amended) A refractive element ~~(10, 20),~~ suitable for refracting x-rays, comprising:

a body of low-Z material having a first end adapted to receive rays emitted from a ray source and a second end from which the rays received at the first end emerge, ~~characterised in that~~

said refractive element ~~comprises~~ having columns of stacked substantially identical prisms ~~(21)~~.

2. (currently amended) The element of claim 1, wherein said prisms are produced by removal of material, the removed material having a width corresponding to a multiple of a phase-shift length ($L_{2\pi}$) of ~~a multiple of~~ 2π.

3. (currently amended) The element ~~according to any of preceding~~ of claims 1, wherein an intensity transmission of the element is:

$$T(y) = \exp(-X(y)/l) = \exp(-k|y|l),$$

where~~in~~ X(y) is the total path length for a ray through the element, l is an attenuation length, k is constant and y is the distance to the optical axis.

4. (currently amended) The element ~~according to any of preceding~~ of claims 1, wherein an effective aperture is defined by:

$$D = \frac{8\delta^2 lF}{\lambda \tan\theta},$$

where~~in~~ *F* is the focal length, δ is the decrement of a real part of an index of refraction, *l* is an attenuation length and Θ is the side angle of the prisms.

5. (currently amended) The element ~~according to any of preceding~~ of claims 1, wherein an aperture increase factor (AIF) is defined by:

$$\mathrm{AIF} = 3.2 \cdot \frac{\sigma_{abs}}{L_{2\pi} \tan\theta} \cancel{,}$$

where~~in~~ σ_{abs} is root-mean-square width of Multi-Prism Lens (MPL) aperture, $L_{2\pi}$ is 2π-shift length, and Θ is the side angle of the prisms.

6. (currently amended) The element ~~to any of preceding~~ of claim~~s~~ 1, wherein said element is made of one or more ~~several~~ of ~~S~~silicon ~~or~~ and diamond.

7. (currently amended) The element ~~to any of preceding~~ of claim~~s~~ 1, wherein a focal length is controlled ~~by~~ according to a deviation length (y_g) of one end of the element with respect to the incident ray.

8. (currently amended) A lens ~~(30),~~ suitable for x-rays, comprising:

a body with low-Z material having a first end adapted to receive rays emitted from a ray source and a second end from which the rays received at the first end are refracted, ~~characterised in that~~

said lens ~~comprises~~ having two portions, each portion ~~comprising~~ including columns of stacked substantially identical prisms ~~(21)~~, said portions being arranged ~~in~~ at an ~~angel~~ angle relative to each other.

9. (currently amended) The lens of claim 8, wherein said prisms are produced by removing~~al~~ ~~of~~ material, the removed material having a width corresponding to a multiple of a phase-shift length ($L_{2\pi}$) ~~of a multiple~~ of 2π.

10. (currently amended) The lens of claim 8, wherein said columns are displaced relative to each other.

11. (currently amended) The lens of claim 10, wherein said columns are rotated relative to each other.

12. (original) The lens of claim 10, wherein said columns are arranged in series.

13. (currently amended) An x-ray apparatus, ~~(86)~~ comprising:

at least ~~an~~ one x-ray source; ~~(87) and~~

a detector assembly; and ~~(88), further comprising~~

a refractive element, ~~according to any of claims 1-7~~ comprising:

a body of low-Z material having a first end adapted to receive rays emitted from a ray source and a second end from which the rays received at the first end emerge,

said refractive element having columns of stacked substantially identical prisms.

14. (currently amended) An x-ray apparatus, ~~(86)~~ comprising:

at least one x-ray source; ~~(87) and~~

a detector assembly; and ~~(88), further comprising~~

a lens, ~~(30) according to any of claims 8 to 12~~ comprising:

a body formed of low-Z material having a first end adapted to receive rays emitted from a ray source and a second end from which the rays received at the first end are refracted,

said lens having two portions, each portion including columns of stacked, substantially identical prisms, said portions being arranged at an angle relative to each other.

15. (currently amended) A method for fabricating an element that includes a body of low-Z material having a first end adapted to receive rays emitted from a ray source and a second end from which the rays received at the first end emerge and that has columns of stacked, substantially identical prisms ~~according to any of claims 1-7~~, ~~the~~ said method comprising:

providing an element ~~comprising~~ having prism-patterns; and

removing parts of said element to provide prisms to be assembled to ~~a~~ said element.

16. (currently amended) The method of claim 15, wherein said prism patterns are provided ~~by~~ using lithographic patterning prior to said removing step.

17. (currently amended) The method of claim 15, wherein said said removing~~al~~ step is achieved by ~~a subsequent~~ deep-etching into silicon.

18. (currently amended) The method of claim 15, further comprising:

using said element as a mold ~~moulds~~ for chemical vapor deposition of diamond.

19. (currently amended) A method for reducing absorption in multi-prism lens, ~~the~~ said method comprising:

removing material in a manner that ~~only~~ results~~ing~~ in a phase-shift of a multiple of 2π.

20. (new) The x-ray apparatus of claim 13, wherein said prisms are produced by removal of material, the removed material having a width corresponding to a multiple of a phase-shift length ($L_{2\pi}$) of 2π.

21. (new) The x-ray apparatus of claim 13, wherein an intensity transmission of the element is:

$$T(y) = \exp(-X(y)/l) = \exp(-k|y|l),$$

where X(y) is the total path length for a ray through the element, l is an attenuation length, k is constant and y is the distance to the optical axis.

22. (new) The x-ray apparatus of claim 13, wherein an effective aperture is defined by:

$$D = \frac{8\delta^2 lF}{\lambda \tan\theta} \quad ,$$

where F is the focal length, δ is the decrement of a real part of an index of refraction, l is an attenuation length and Θ is the side angle of the prisms.

23. (new) The x-ray apparatus of claim 13, wherein an aperture increase factor (AIF) is defined by:

$$\mathrm{AIF} = 3.2 \cdot \frac{\sigma_{\mathrm{abs}}}{L_{2\pi} \tan\theta},$$

where σ_{abs} is root-mean-square width of Multi-Prism Lens (MPL) aperture, $L_{2\pi}$ is 2π-shift length, and Θ is the side angle of the prisms.

24. (new) The x-ray apparatus of claim 13, wherein said element is made of one or more of silicon and diamond.

25. (new) The x-ray apparatus of claim 13, wherein a focal length is controlled according to a deviation length (y_g) of one end of the element with respect to the incident ray.

26. (new) The x-ray apparatus of claim 14, wherein said prisms are produced by removing material, the removed material having a width corresponding to a multiple of a phase-shift length ($L_{2\pi}$) of 2π.

27. (new) The x-ray apparatus of claim 14, wherein said columns are displaced relative to each other.

28. (new) The x-ray apparatus of claim 27, wherein said columns are rotated relative to each other.

29. (new) The x-ray apparatus of claim 27, wherein said columns are arranged in series.